

Simplifying High Performance Data Systems for Transaction Processing

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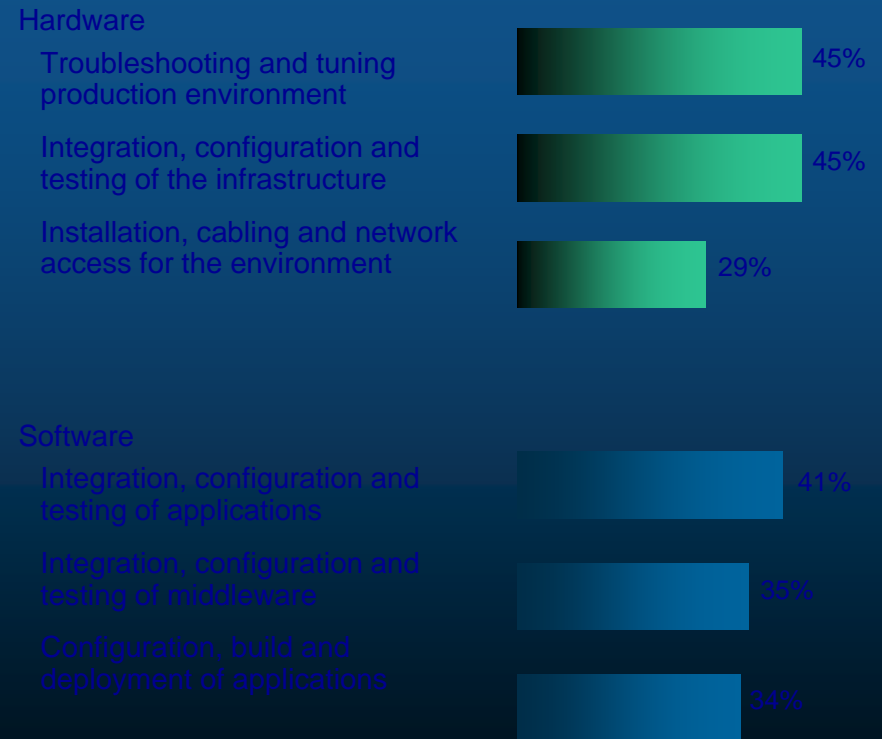
Clients struggle to overcome barriers of time, cost and risk

Typical IT Project Time and Budget

Phase	Time (days)	Budget
Specify/design	73 - 96	14% - 16%
Procure	57 - 112	19% - 21%
Implement	74 - 93	12%
Configure/test	74 - 80	10% - 11%
Cluster & HA	66 - 104	11% - 12%
Backup	44 - 108	10%
Tune	89 - 98	9% - 10%
Management	67 - 110	9 - 10%

34% of new IT projects (US) deploy late

Top Causes of Project Delays



From a commissioned study conducted by Forrester Consulting on behalf of IBM

Today's Data Challenges Demand Transactional Performance and Efficiency

- Data systems optimized for transactions
- High performance and throughput
- Efficient scalability - for traditional and cloud environments
- Simplicity - across development and operations



PureData

IBM PureData System for Transactions



*Simplifying deployment & management of
high performance databases*

- Integrated compute, networking and storage resources
- Patterns for high-scale cluster topologies & databases
- Intelligent use of solid state and disk storage
- Integrated monitoring, management and maintenance

Simplified Experience

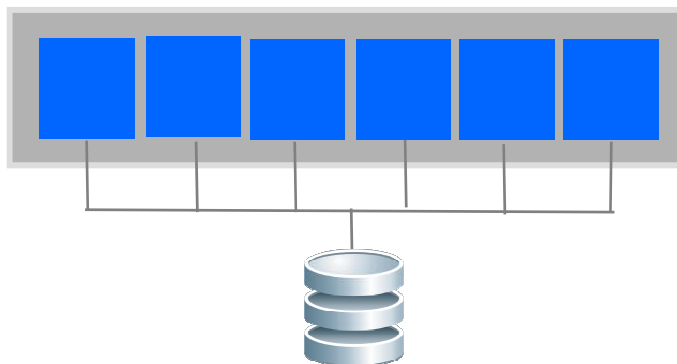
Uninterrupted access to data with consistent performance

Traditional systems - build it yourself

Over several days/weeks:

1. Define High Availability topology
2. Configure HW/SW/Network
3. Set up storage pools
4. Install multiple operating systems
5. Install database instances
6. Set up primary and secondary management systems
7. Set up database members
8. Set up backup processes
9. Test, tune, reconfigure

6-node database cluster



PureData System - built-in expertise

In minutes,

1. Just specify database, description and topology pattern

Built-in Expertise

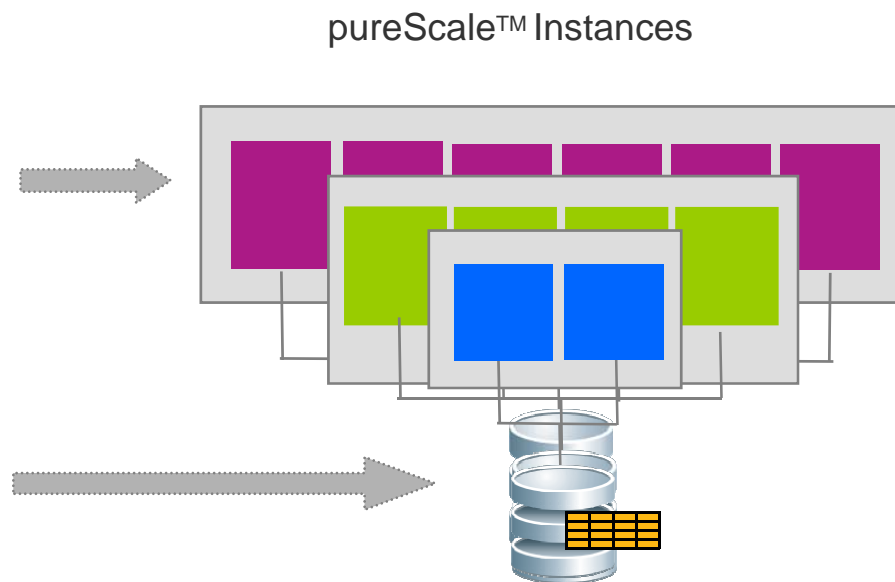
Deploy topology and databases in minutes using patterns

Topology patterns

Automatically creates, configures and deploys a database system topology with built-in redundancy and high performance

Database patterns

Automatically creates, configures and deploys IBM or client-specified databases optimized for transactional workloads



Clients are Experiencing the Value of DB2 Scalability

Business Need

A competitive new application for dynamic transaction routing to capture **a new market opportunity**



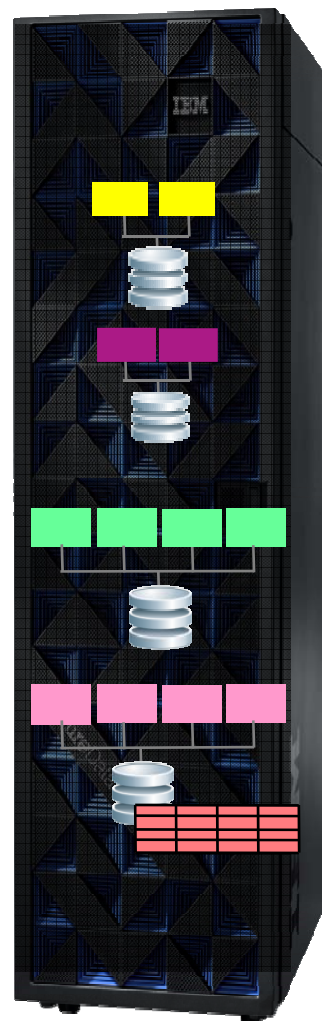
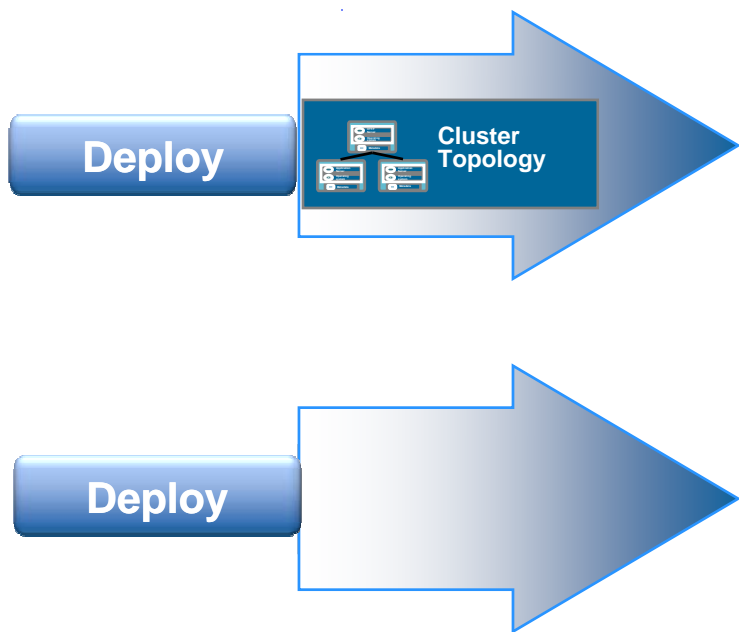
Why DB2?

- Lower cost transaction processing which improved competitiveness
- Ability to easily handle high transaction volumes during peak shopping days
- Extremely high availability at the required scale

**Global Leader in
Payment Processing**

Pattern Based Database Deployment

Capture your expertise in patterns for consistent, reliable deployment of critical database services



Consolidate

more than 100 database servers to a single system for optimal resource efficiency and easier administration

Optimize

data compression with up to 10x storage space savings

Innovate

faster by deploying new databases in minutes

Accelerate




deployment of new database services in cloud environments using patterns of expertise

Welcome Page




IBM PureData System for Transactions |
 Workload Console |
 System Console |
 Default Admin |
 Help |
 Logout

Welcome |
 Database |
 Cloud |
 System

▼ **Setting up your DB2 pureScale instances**

 <p>Step 1: Configure Tivoli Storage Manager</p> <p>Define settings to enable cloning, manual and scheduled database backups.</p> <p>Enter storage manager server information</p>	 <p>Step 2: Configure LDAP</p> <p>Define settings to enable system-wide user authentication.</p> <p>Enter LDAP server information</p>	 <p>Step 3: Create DB2 pureScale instances</p> <p>Create your DB2 pureScale database instances so users can deploy databases.</p> <p>Deploy DB2 pureScale instance</p>
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▼ **Working with your databases**

 <p>Step 1: Create a database</p> <p>Create a new database with specified provision options.</p> <p>Deploy database</p>	 <p>Step 2: View databases</p> <p>View the current status, metrics, and details of databases in the system.</p> <p>View database</p>	 <p>Step 3: View database tools</p> <p>View tools for database design, application development, administration, and health monitoring.</p> <p>View database tools</p>
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Database Cluster Topology: Deploy

IBM PureData System for Transactions | Workload Console | System Console | Default Admin | Help | Logout

Welcome | Database | Cloud | System

DB2 pureScale instances | db2inst1 | Start | Stop | Manage | Update | Maintain | Resume | Delete

DB2 pureScale instance

Specify options for your new DB2 pureScale instance

DB2 pureScale instance name:

Description:

Size

Small (2 compute nodes)

Medium (4 compute nodes)

Large (6 compute nodes)

Database compatibility mode:

Database version:

Database level:

Advanced options

Port number:

Maximum number of databases:

Type	Host name	Status	IP address
CF	192	Running → Log	192.168.74.140
CF	192	Running → Log	192.168.74.141

Database Cluster Topology: View

IBM PureData System for Transactions | Workload Console | System Console | Default Admin | Help | Logout

Welcome | Database | Cloud | System

DB2 pureScale instances | db2inst1 | Start | Stop | Manage | Update | Maintain | Resume | Delete

DB2 pureScale instance name

db2inst1

Status: Running → Monitor → Log

Size: Small (2 CFs and 2 members on 2 compute nodes)

Maximum number of database: 10

Configuration:

Type	Host name	Status	IP address
CF	192	Running → Log	192.168.74.140
CF	192	Running → Log	192.168.74.141
MEMBER	192	Running → Log	192.168.74.140
MEMBER	192	Running → Log	192.168.74.141

Deployed databases

Database	Deployed by	Status	Actions
tracy2	admin	Error → Log → Monitor	Add storage
tracy1	admin	Error → Log → Monitor	Add storage
tracy3	admin	Error → Log → Monitor	Add storage

Database Pattern: Creation

IBM PureData System for Transactions | Workload Console | System Console | Default Admin | Help | Logout

Welcome | Database | Cloud | System

Database Patterns | Deploy | Edit | Delete

Database Pattern

Specify options for your new database pattern.

Database pattern name:

Database pattern description:

Source: Apply a default database workload st

Name	Description
<input checked="" type="radio"/> OLTP	For databases primarily used for online transaction processing (OLTP). The database will be optimized for transactional applications.

Database version: DB2 Version 10.1 for Linux

Database level: DB2 Version 10.1 Fix Pack 1 for Linux

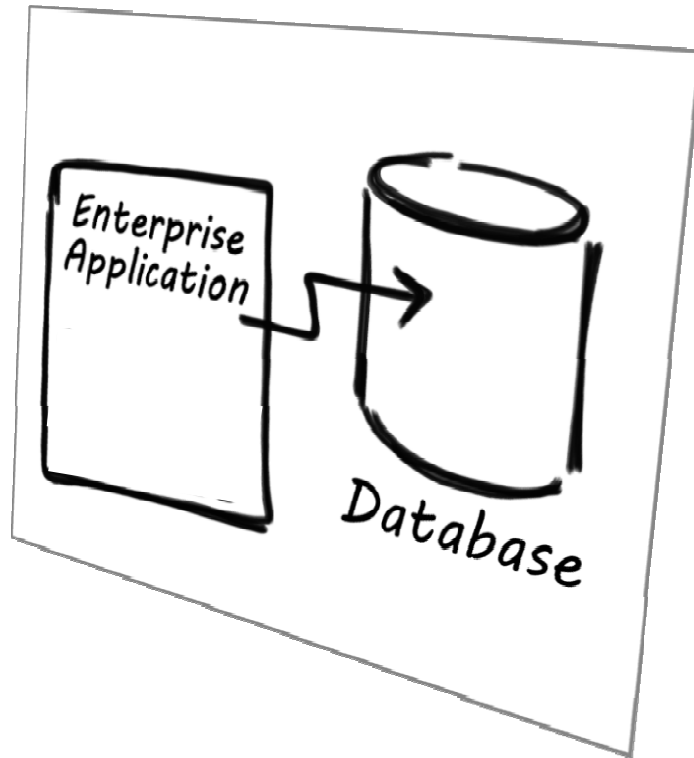
Database size (GB): 120

Database compatibility mode: DB2 (Default)

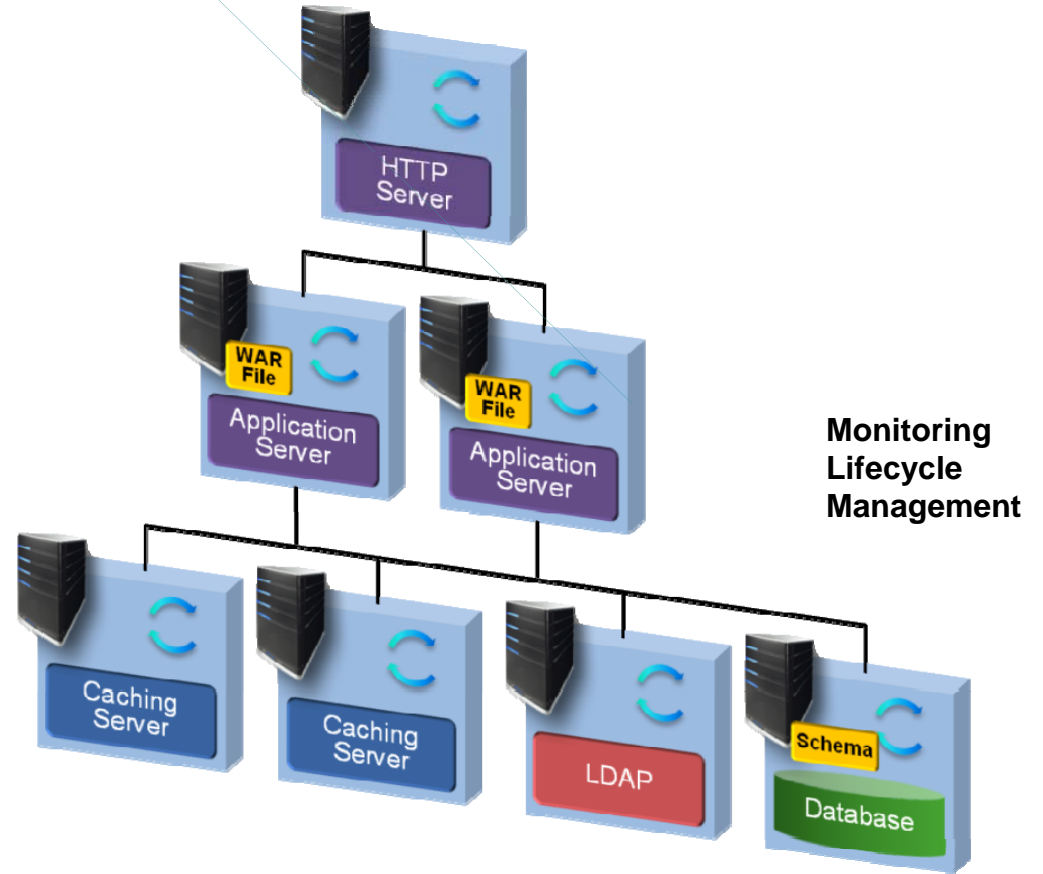
Schema file:

Advanced options

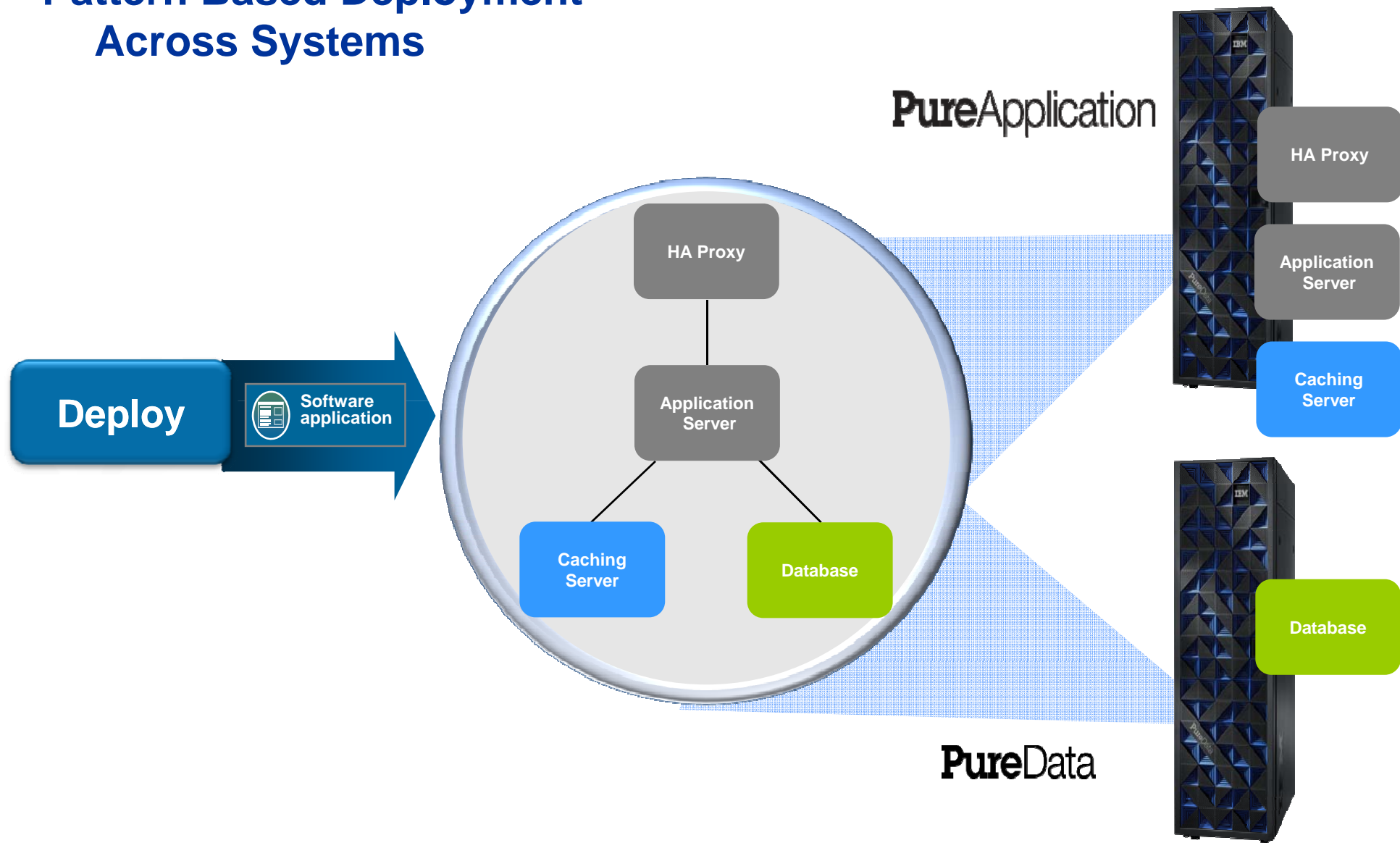
What the business wants...



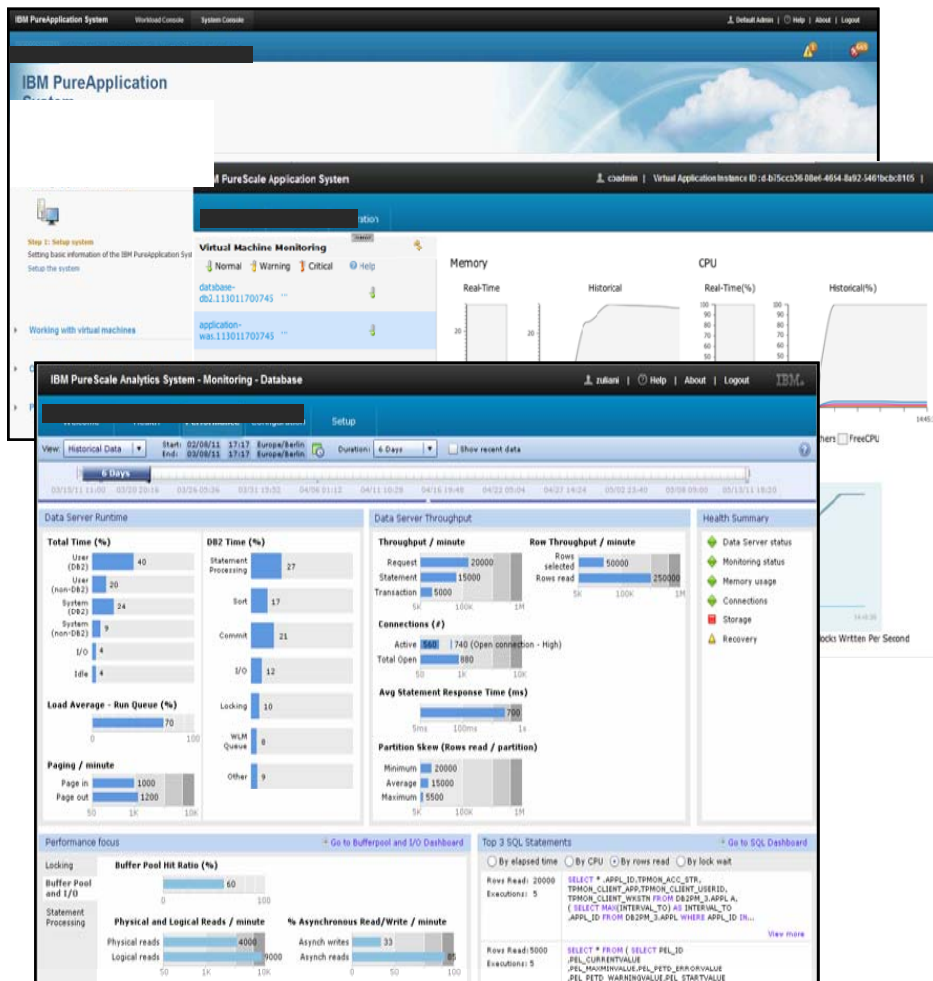
What's required...



Pattern Based Deployment Across Systems



Simplified Experience



- Consistent IBM PureSystem console to manage all resources and workloads
- Easy integration with data center monitoring tools and processes
- Role-based security and tasks
- Single point of contact for support
- System firmware and OS updates applied with no planned downtime

Database Management

Database Service Console - asdb1 Workload Console System Console Default Admin | Help | Logout

Monitoring - **Operation** - Logging

Operations - asdb1

asdb1 Database

- ▼ Backup image management
 - + Schedule database backups
 - + Create a database image
 - + List all database images
- ▼ Storage management
 - + Database storage

Operation Execution Results

Name	Created Time	Result	Return Value
No operation results			

Database Management: Backup

The screenshot shows the IBM PureData System for Transactions Database Management Console. The browser window title is "IBM PureData System for Transactions - Mozilla Firefox". The URL is "https://10.155.7.130/dashboard/runtime/pureScale/". The page title is "Database Management Console - liuyydb5". The user is logged in as "Administrator".

The main navigation bar includes "Monitoring", "Operation", and "Logging". The "Operation" tab is selected, showing "Operations - undefined". A sidebar on the left lists "liuyydb5" under the "Database" category.

The main content area is titled "Fundamental" and contains the following sections:

- Schedule database backups**: Select the frequency of automatic database backup or disable backup. The "Frequency" dropdown menu is open, showing options: "Off", "Once", "Daily", "Weekly", and "Off". A "Submit" button is located below the dropdown.
- Create a database image**: A button with a plus sign.
- List all database images**: A button with a plus sign.

Below the configuration area is the "Operation Execution Results" section, which contains a table with the following data:

Name	Created Time	Result	Return Value
backupdb	Oct 2, 2012 4:04:59 PM	transactionalDatabase-RegularNode.RegularNode: Success ✓	transactionalDatabase-RegularNode.RegularNode: The database backup is created successfully

At the bottom of the page, the copyright notice reads: "© Copyright IBM Corporation 2012. All Rights Reserved. 3.1.0.5-20120928145853 / 20120928-1456-583".

Database Management: Storage

Database Service Console - asdb1 | Workload Console | System Console | Default Admin | Help | Logout

Monitoring | **Operation** | Logging

Operations - asdb1

asdb1 Database

- Backup image management
- Storage management
 - Database storage**

File system	Allocated storage	Storage usage	Actions
Table spaces	2GB	90%	Add storage
Logs	12GB	90%	Add storage
Mirrored logs	2GB	20%	

Operation Execution Results

Name	Created Time	Result	Return Value
No operation results			

Infrastructure Map

The screenshot displays the IBM PureData System for Transactions Infrastructure Map in Graphics View. The top navigation bar includes 'Workload Console' and 'System Console'. The main header shows 'Welcome', 'Cloud', 'Hardware', and 'System' tabs. The 'Hardware' tab is active, showing the 'Infrastructure Map (Graphics View)'. The interface includes a 'Legend' on the left, a central rack view, and a 'Rack: 8739/10C357D' details panel on the right.

Legend:

- All
- Critical
- Warning
- CPU utilization
- Memory utilization
- Storage utilization
- Network utilization
- Hosts
- Volumes

Rack: 8739/10C357D Summary:

- Status: Available
- Input power total: 952 W
- Default:
 - Critical: 0
 - Warning: 0

System: PureApplication System

The rack view shows server units with status indicators (Warning, Critical) and utilization metrics (e.g., 68% CPU, 75% Memory, 5% Storage, 4% Network).

Storage View

IBM PureData System for Transactions Workload Console System Console Default Admin | Help | Logout

Welcome Cloud **Hardware** System

Storage Devices

- Storage Node**
78N22CV @ Rack 8739/10C357D > Unit 27
- Storage Node Expansion**
78N20HK @ Rack 8739/10C357D > Unit 29
- Storage Node**
78N22GM @ Rack 8739/10C357D > Unit 23
- Storage Node Expansion**
78N1X46 @ Rack 8739/10C357D > Unit 25

Storage Node

Events: ! Error: 0 ! Warning: 5

Jobs: ! Pending jobs: 0 ! Started Jobs: 0

Type: Storage Node

Firmware: 6.3.0.3

Status: ! Available

Capacity:

Location: [Rack 8739/10C357D > Unit 27](#)

Temperature: Ambient Temperature: 48°C !
Exhaust Temperature: 48°C !

Physical cores: 1% (0.08 / 8 used)

Disk Drives: total: 24 ! Available: 24

Operating system volumes: total: 6 ! Available: 6

Storage volumes: total: 66 ! Available: 66

LUNs: total: 4 ! Available: 4

Storage controller ports: total: 4 ! Available: 4

Storage node statistics:

PureData System for Transactions

Full Rack Capabilities (Large)	
384 processor cores	More cores to optimize transactional performance
6.2 TB of memory (DRAM)	Allows more queries to execute entirely in-memory
19.2 TB of flash (SSD)	Allows placement of your most important transactional database objects on the fastest storage (48x400B)
128 TB of disk (HDD)	High performance storage for today's growing data demands (144x900GB)
1,500,000 IOPS	Provides sustained high performance transactional throughput
Advanced Storage Tiering	Automatically migrates most important data to the fastest storage
Advanced Adaptive Compression up to 10x	Allows you to store more data in less space while speeding queries through reduced I/O transfers
High Speed Interconnect	RDMA (Remote Direct Memory Access) for low latency and near-linear scalability
Dual 10 GB network	High speed redundant database connectivity speeds application performance



PureData System for Transactions

3 standard configurations to choose from



Configurations	Upgrade		Upgrade	
	Small ¼ Rack	Medium ½ Rack	Large Full Rack	
Compute Chassis	1	1	2	
Blacktip ITEs (16 cores per ITE)	6	12	24	
Cores	96	192	384	
Memory	1.5 TB	3.1 TB	6.1 TB	
V7000 + Exp	2	4	8	
User Capacity	18.6 TB	37.2 TB	74.4 TB	
Raw SSD Storage (400 GB drives)	4.8 TB	9.6 TB	19.2 TB	
Raw HDD Storage (900 GB drives)	32.4 TB	64.0 TB	128.0 TB	